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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,440	08/16/2001	Michael J. Betenbaugh	PF509P2	1490

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EXAMINER

RAO, MANJUNATH N

ART UNIT	PAPER NUMBER
1652	17

DATE MAILED: 10/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/930,440	BETENBAUGH ET AL.	
	Examiner Manjunath N. Rao, Ph.D.	Art Unit 1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 03 September 2002.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) 2-47 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1 and 48-55 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 16 August 2001 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) Paper No(s). <u>16</u> . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3,15</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-55 are still at issue and are present for examination. Claims 1, 48-55 are now under consideration. Claims 2-47 remain withdrawn from consideration as being drawn to non-elected invention.

Election/Restrictions

Applicant's election with traverse of Group I, Claim 1, and new claims 48-55 in Paper No. 14 and 16 (see interview summary) is acknowledged. The traversal is on the ground(s) that claims 1, 2, 5, 26 and 44 are all generic linking claims and as generic claims, claim 1 encompasses the subject matter of claim 25 and generic claim 2 encompasses the subject matter of claims 3-4, generic claim 5 encompasses the subject matter of claims 6-24 and 44 etc.

Applicants also argue that claims 5-24 and 46 are linked with claims 26-45 and 47 as product and process of using claims and accordingly claims should be regrouped. Examiner respectfully disagrees with the applicants that claims should be regrouped simply because they are generically linked. For example applicants argue that claim 25 should be regrouped with claim 1. However, claim 1 is drawn to a cell which produces only CMP-SA above endogenous levels while claim 25 is drawn to a Kit expressing sialylated glycoproteins (irrespective of the fact whether it comprises the cell of group I or not). Furthermore, Examiner has in fact restricted claims almost in accordance to applicant's line of argument. For example, Examiner has grouped claims 2-4 in group II, claims 5-25 and 46 in group III etc. However, Examiner disagrees with the applicant that all the remaining claims should be regrouped. This is because the originally grouped claims are drawn to distinct inventions as explained in the previous Office

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action. Furthermore, contrary to applicant's argument coexamination of all of Groups II-VI would not require independent searches, examination of all groups does require independent searches and would be a burden on the examiner. Such argument is also not found persuasive because while the searches for the remaining groups overlap, they are not coextensive and does require extensive search of the non-patent literature. Also the search for Groups II through VI would each require the search of subclasses unnecessary for the search of elected Group I as indicated in the previous Office action.

The requirement is still deemed proper and is therefore made FINAL.

Claims 2-47 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention, the requirement having been traversed in Paper No. 14 and 16.

Priority

Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged.

Drawings

Drawings submitted in this application are accepted by the Examiner for examination purposes only.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1 and 48-55 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1 and 48-55 are drawn to a “a cell” which reads on any or all unicellular organisms which are products of nature. Amending the claim to recite “An isolated or purified cell” to show the hand of man would overcome this rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 and claims 48-55 which depend therefrom are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites the phrase “above endogenous levels”. It is not clear to the Examiner as to which cells’ endogenous levels applicants are comparing the level of CMP-SA in the claimed cell. If applicants intend to claim a recombinant cell or genetically modified cell that produces more CMP-SA than the levels it produced before being made recombinant or genetically modified, amending the claim accordingly would overcome this rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 52, 54 are rejected under 35 U.S.C. 102(b) as being anticipated by Munster et al. (PNAS, 1998, Vol. 95:9140-9145). This rejection is based upon the public availability of a printed publication. Claim 1 of the instant application is drawn to a cell of interest producing a donor substrate CMP-SA, CMP-Neu5Ac, above endogenous levels. Munster et al. disclose two cell types, mutant Chinese hamster ovary cells LEC29.Lec32 transfected with a cDNA expressing mouse CMP-Neu5Ac leading to accumulation of CMP-SA above the endogenous levels (i.e., before transfection) and a mutant /recombinant *E.coli* EV5 cells transformed with a cDNA expressing mouse CMP-Neu5Ac synthetase leading to accumulation of CMP-SA above the endogenous levels (i.e., before transformation). Therefore Munster et al. anticipate claims 1, 52 and 54 of this application as written.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 48-51 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munster et al. (PNAS, 1998, Vol. 95:9140-9145) as applied to claims 1, 52 and 54 above, and further in view of Ogonah et al. (Biotechnol., 1996, Vol. 14:197-202) and the common knowledge in the art of molecular biology. Claims 1, 48-51 and 53 in this instant application are drawn to a cell of interest producing a donor substrate CMP-SA, CMP-Neu5Ac, above

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endogenous levels wherein the cell is a insect cell, specifically either a *S.frugiperda*, or *T.ni* or *E.acrea* or *Drosophila* or a yeast cell, a plant cell or a fungal cell. Munster et al. already teach a method to make a recombinant bacterial cell or a mammalian cell which can express the cDNA required for the synthesis of CMP-SA. However, the reference does not teach insect cells, yeast cells, plant cells or fungal cells expressing CMP-SA higher than endogenous levels.

Ogonah et al. teach method to isolate and characterize insect cell lines which are able to perform the complex N-linked glycosylation on recombinant proteins. The reference teaches *S.frugiperda* (Sf9) cells capable of performing limited levels of glycosylation such as generation of chitobiose, truncated tri-mannose core or oligomannose core and the more extensive glycosylation abilities of *E.acrea*, Ea4.

Combining the teachings of both Munster et al., which teaches vectors expressing the cDNA for synthesis of CMP-SA, and the teachings of Ogonah et al. which teaches the more extensive glycosylation capacities of *E.acrea* Ea4 cells, it would have been obvious to one of ordinary skill in the art to make a insect cell such as *E.acrea* transformed with the vector taught by Munster et al. and come up with a insect cell which will have the capacity to sialylate recombinant proteins because of its capacity to accumulate CMP-SA above endogenous levels. One of ordinary skill in the art would be motivated to develop such a cell because insect cells can be adapted to grow in bulk quantities but have limited application to produce recombinant glycoproteins because of its incomplete glycosylation machinery. Providing an insect cell capable of accumulating endogenous CMP-SA would be an added advantage towards production of recombinant glycoprotein which can also be sialylated. One of ordinary skill in the art would have a reasonable expectation of success since Ogonah et al. provide a insect cell line in which

they demonstrate more extensive glycosylation capabilities and Munster et al. provide a vector which can be used to transform cells of Ogonah et al. which can be further made to not only glycosylate but also sialylate the recombinant glycoproteins.

Furthermore, it would also have been obvious to one of ordinary skill in the art to use the teachings and the cDNA sequence of Munster et al. and combine it with the common knowledge in the art regarding the techniques available for transfecting yeasts, plant cells or fungal cells and transform or transfet either a yeast cell or a fungal cell or a plant cell to make transgenic cells capable of accumulating CMP-SA. One of ordinary skill in the art would have a motivation to do so as the above hosts are capable of industrial level of production and the commercial demand for CMP-SA. One of ordinary skill in the art would have a reasonable expectation of success since the art teaches a number of methods to transform/transfet yeasts, fungi and plants and Munster et al. provide the most essential item required for doing the same, i.e., the vector expressing the gene required for synthesis of CMP-SA.

Therefore the claimed invention would have been *prima facie* obvious to one of ordinary skill in the art.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Conclusion

Claim 55 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manjunath Rao whose telephone number is (703) 306-5681. The Examiner can normally be reached on M-F from 7:30 a.m. to 4:00 p.m. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, P.Achutamurthy, can be reached on (703) 308-3804. The fax number for Official Papers to Technology Center 1600 is (703) 305-3014. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Manjunath N. Rao Ph.D.
10/23/02



MANJUNATH RAO
PATENT EXAMINER